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### **Interaction model for educational collaboration between the academic and non-academic sector - discussion paper**

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## **Deliverable D3.1**

# **Interaction model for educational collaboration between the academic and non-academic sector**

25/03/2021



## EXECUTIVE SUMMARY

The role of doctoral education as the space for knowledge exchange, co-creation, and a tool to enhance European competitiveness and innovation capacity, is widely agreed upon. Precise models or roadmaps as to what a specifically 'Europeanized' model for doctoral training looks like remains, however, on the drawing board. The collaboration takes different forms, develops doctoral researchers' skills including their innovative thinking and entrepreneurship, and thus contributes to economic growth and employment both locally and internationally.

This report maps the characteristics of doctoral education as a mediator between potential different learning environments: the university and non-academic sector. It is based on a review of literature and reports on collaborative doctoral education, and materials consisting of regional stakeholder workshops organized as part of the DocEnhance project. The report formulates some key questions to be discussed particularly in the beginning phases of stakeholder collaboration. Clarifying joint objectives and practices in stakeholder collaboration from the start secures transparency on the organizational level and supports that it is more routinely and structurally included in the doctoral curriculum.

An initial model is provided to support the discussion on shared and stated-out objectives and practices of collaboration between universities and the non-academic sector. The conciseness of the report enables potential readers to use it as one sounding board when building and boosting collaborative doctoral education practice. In conclusion, the following points are raised:

- It takes time to build understanding on the shared goals of the collaboration in the context of doctoral education and to identify both individual and the organizational interests and objectives.
- Formal agreements and arrangements need to be available from the beginning of the process.
- The diversity of possible actors requires space for flexibility in collaboration and rechecking the goals throughout the process.
- Transparent collaboration practices and supervision agreements (roles, division of labor, practices) secure the quality of collaboration for both sectors.
- Pedagogical practices grounded in two contexts ideally engage the doctoral researcher to be active in the process.
- Continuity in collaboration requires and is based on trust between parties.
- Knowledge-exchange is very much about mindset, personal qualities, and researcher mission in collaboration.
- The structural and cultural obstacles in the process cannot be solely overcome by economic solutions.
- Organizational collaboration between the university and non-academic sector is one key means to develop core regional ecosystems with global impact.



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## 1. INTRODUCTION

Doctoral education is an essential contributor, shaping the link between education, research, and innovation, and impacting Europe's economic, scientific, technological, and social development. Most doctoral graduates find employment outside academia, in business, industry and the third sector through which they have direct impact on how research is understood in society (Törnroos 2017). This important mediator role can be supported by building routine and continuous dialogue between the academic and non-academic sectors, and by better understanding and mapping the competencies needed in the post-defense career.

This report maps out some of the characteristics of doctoral education that build on close collaboration between potential different learning environments: the university and non-academic sector. The university carries the key task of academic and research education, while industry, understood in its broadest sense to include public and private sectors, provides the surroundings for doctoral researchers' professional growth as a researcher and expert. The key elements in this crucial collaborative process between university research and stakeholders is given center stage in this report.

International EU level guidelines for doctoral education (EUA, EUA-CDE) form the generic frame for this document. The more immediate frame is the DocEnhance project (2021-2023) that aims to enhance transferable skills intelligence and integration into existing PhD programmes in Europe. The major outputs of the project are a recommended transferable skills curriculum for PhD programmes, a novel course concept and material, and an open access career-tracking survey. As part of the wider project, the task here is to define key factors in high-quality doctoral educational collaboration and present an initial doctoral educational collaboration model.

### 1.1. The scope and material used

The approach in constructing the model of education collaboration between academic and the non-academic sector is built on two types of materials. Based on an initial review of research literature and reports on collaborative doctoral education, we identify key indicators of doctoral educational collaboration between universities and the non-academic sector. The second set of materials consist of regional stakeholder workshops organized as part of the DocEnhance project. These provide grass-root level information on collaboration models and the transferable skills seen as central. In addition, some national reports and research articles were utilized. Table 1 lists the main resources used.



International reports	The DocEnhance project, four skills-prioritizing regional stakeholder workshops (RSW) in 2020
<ul style="list-style-type: none"> <li>Universities without walls. A vision for 2030. EUA European Universities Association. Report February 2021.</li> <li>Collaborative doctoral education in Europe: Research partnerships and employability for researchers. EUA Publications 2015.</li> <li>Handbook for Supervisors of Doctoral Researchers. The handbook is produced in the SuperProfDoc project by Eurodoc (the European Council of Doctoral Researchers and Junior Researchers).</li> <li>The European Charter for Researchers. The Code of Conduct for the Recruitment of Researchers 2005.</li> <li>Report of the ERA Steering Group Human Resources and Mobility (ERA SGHRM).</li> </ul>	<ul style="list-style-type: none"> <li>RSW1 organized by Matej Bel University in Slovakia was oriented towards transferable skills in the non-profit sector</li> <li>RSW2 organized by Tampere University in Finland was focused on doctoral education in cooperation between industry and university and transferable skills making researchers more industry- and society-ready.</li> <li>RSW3 was organized by Fundación Universidad-Empresa and the University of Alcala in Spain on the topic Transferable skills in the Technology sector.</li> <li>RSW4 was organised by the University of Tromsø in Norway and was oriented towards data stewardship and related transferable skills.</li> </ul>

**Table 1.** The resources used in constructing the initial collaboration model

The report also summarizes discussions in the DocEnhance project meetings on crucial transferable skills needed in doctoral education, and on the role of different kinds of learning environments connected to doctoral education practices.

## 1.2. Limitations

The report is produced in the context of the DocEnhance project funded by the Horizon 2020 Science with and for Society programme. The reflections and conclusions of the report are based on the limited existing material and discussions in the project that do not meet the criteria of research. The concise report perhaps enables potential readers to use it as one sounding board when building and boosting collaborative doctoral education practice.



## 2. DOCTORAL EDUCATION AS A RESEARCH AND LEARNING ENVIRONMENT

The ERA Steering Group on Human Resources and Mobility (ERA SGHRM) formulated seven “Principles of Innovative Doctoral Training” (IDTP). The work was done as part of the Mapping Exercise on Doctoral Training in Europe in 2011. The principles - research excellence, attractive institutional environment, internal quality assurance, exposure to industry and other relevant employment sectors, interdisciplinary research options, international networking, and transferable skills – helped the universities to further develop their doctoral education. The list challenged universities to also self-assess how doctoral education functions as a research and learning environment for various societal needs as well as doctoral researchers’ learning needs and goals.

The themes listed in 2011 remain essential today. Universities need to rethink what constitutes an attractive learning environment now and, in the future, and how the role of individual universities and the broader stakeholder interests and expertise could be merged. The vision for universities 2030 by the European University Association provides key perspectives for the further development of doctoral education that reaches out to society at large and encourages co-creation with stakeholders (2021, 11). This vision underlines the hybrid nature and structure of future universities with strong societal engagement and contributions. This consists of universities that are both physical and digital learning and research environments designed to pay attention to different needs, skills development, and goals, including sustainable development. While the Covid-19 pandemic highlighted the increased need for digital learning possibilities, the report also states that “the physical campus will continue to be crucial as a place for social interaction and dialogue” (EUA report, 2021). Digital learning possibilities bring in new features to the collaboration between universities and the non-academic sector. The potential is obvious, but little research-based knowledge is available on how the collaboration works and how learning goals are to be achieved in collaborative doctoral education in the highly digital space.

Regarding the funding in building rich research and learning ecosystems, the report states that regulatory and funding frameworks at the relevant regional, national, and European level should also strengthen and protect university autonomy in its various dimensions, enabling institutions to make strategic decisions (EUA report, 2021). This does not exclude intensive research and educational collaboration with stakeholders - quite the opposite.

Regarding the nature of the target group of doctoral researchers, there have been large ongoing transformations within doctoral education over recent decades. These changes like the number and internationalisation of doctoral researchers, the diversification of their backgrounds, reasons for studying and career trajectories, and the increase of regulations in doctoral education (e.g., agreements, guidelines, and rules to ensure the quality of supervision) have led to a situation where doctoral education is expected to provide knowledge and competence for the candidates in a broad framework (Taylor 2012).



In the development work universities already strongly share the understanding of the importance of doctoral education as a key part of the international and multidisciplinary research environment. Doctoral education can be built with the aim of ensuring that educational offerings enable doctoral researchers to pursue diverse opportunities for learning and development and develop their research and employability skills in an international context. This means that the international aspect of intersectoral collaboration must be considered. The COVID-19 situation has challenged universities and funding programmes to develop their practices.

### 3. WORKING LIFE RELEVANCE IN DOCTORAL EDUCATION

Doctoral education aims to provide doctoral researchers knowledge and skills to pursue a wide range of career options. The topical themes to be covered during the educational process include not only methodological and discipline-based studies and activities but also, crucial content on open science, data management, communication, the impact of research and the safeguarding of research integrity. The development of digital environments, and artificial intelligence within these environments, while considering the requirements for sustainable development, are important areas of development in the field of doctoral education in Europe. Broad consensus exists that interdisciplinary skills, in the areas of project management, entrepreneurial thinking, people management, communication or technology transfer, form key requirements identified by employers, within and outside the academic world.

Universities planning and implementing doctoral education cover the broad scale of the role of research in society and researcher responsibilities. The European Charter (2005) as the European Commission Recommendation sets out the responsibilities for researchers as follows:

- Research freedom
- Ethical principles
- Professional responsibility
- Professional attitude
- Contractual and legal obligations
- Accountability
- Good practice in research
- Dissemination, exploitation of results
- Public engagement
- Relationship with supervisors (and managers)
- Supervision and managerial duties
- Continuing professional development.

(see Vitae <https://www.vitae.ac.uk/doing-research/research-staff/practicalities-of-being-research-staff/your-responsibilities-as-a-researcher>)

The list doesn't explicitly indicate certain type of interaction between the university and non-academic sector, but rather, provides a broad field for collaborative activities. Current discussions, for example on challenge-based research, citizen science and dissemination and communication activities of researchers, are increasingly brought up, often as researchers' research orientation.



### 3.1. Mobility

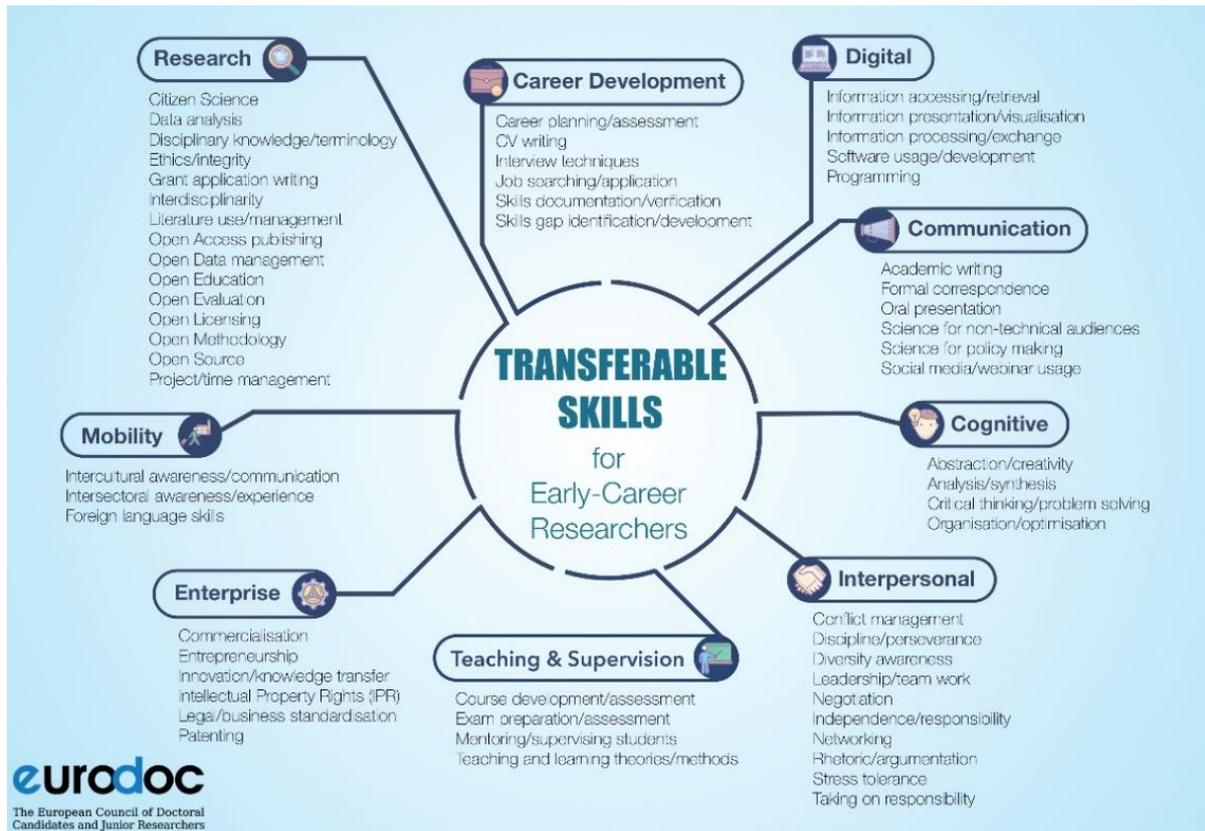
International mobility is one of the cornerstones of doctoral studies. International experiences strengthen competencies of doctoral researchers and help them expand their network of contacts and broaden the supervisory oversight of their research. In addition to mobility between universities, intersectoral mobility and secondments are increasingly seen as a tool for stakeholder and industry collaboration, and as a practical means of opening doors to the global job market. More recently, the Covid-19 pandemic has strengthened discussions on the key models and practices of virtual mobility. Essentially, mobility between two sectors requires shared understanding of the goals, agreements, and the financial costs between collaborators. The MSCA Innovative Training Network action serves as one benchmark of a widely tested model for the development of similar schemes across universities.

In MSCA ITN programmes doctoral researcher have a secondment period during their studies, that is defined as a period spent at another organisation with the aim of implementing doctoral researcher's individual research project. In the guidelines of ITNs intersectoral secondments (i.e. between the academic and non-academic sectors) are particularly encouraged. At the same time, the time spent outside the university is limited within the three-year recruitment period.

However, little research is available on how the secondments work in practice, how supervision is organised between two sectors and how practices in non-academic placements are organised regarding the tasks and duties that the doctoral researcher is expected to perform during the secondment. Embedding intersectional mobility firmly into doctoral education curricula depends not just on financial resources but also on how such mobility experiences in the non-academic sector are understood and appreciated by the PhD supervisors. One impact of collaborative programmes can be that these will be increasingly driven by the development of more strategic approaches to collaborative research and knowledge exchange.

### 3.2. Transferable skills and stakeholder collaboration

The range of potential transferable skills developed during the doctorate is wide. The transferable skills defined by Eurodoc is also an essential resource in the career tracking survey that DocEnhance implements for doctoral graduates in 2021. It raises questions about how universities can ensure that doctoral researchers gain most of the skills at least to some degree.



**Figure 1.** Transferable skills for doctoral researchers defined by Eurodoc.

Key transferable skills were discussed in four workshops organized by different DocEnhance partners for external stakeholders in 2021. Each workshop focused on a career sector chosen to represent crucial challenges of the 21st century. The purpose of the Regional Stakeholders Workshops (RSWs) was to better understand what skills are needed across Europe within each of the chosen sectors. RSW1, organized by Matej Bel University in Slovakia, was oriented towards transferable skills in the non-profit sector. RSW2, organized by Tampere University in Finland, was focused on doctoral education in cooperation between industry and university and transferable skills to make researchers more industry- and society-ready. RSW3 was organized by Fundación Universidad-Empresa and the University of Alcalá in Spain on the topic ‘Transferable skills in the Technology sector’. RSW4 was organised by the University of Tromsø in Norway and was oriented towards data stewardship and related transferable skills. Academics and research stakeholders identified key transferable skills needed and valued in the non-academic sector. The lists in Table 2 are not in the order of importance and they cannot be compared as such as the workshops were organised with different focuses and programmes (Bitušíková & Borseková 2020, DocEnhance deliverable 1.1).



The table clearly shows that personal and people skills, communication and presentation skills, organisational skills and management skills are highlighted. These findings clearly resonate with the broader literature and are not surprising as such. At the same time traditional academic skills like writing, critical thinking, problem solving etc. cannot be separated from relevant transferable skills identified. The table demonstrates that doctoral education should ensure a broad competence that is transferable to different kinds of work environments, and that researcher skills in themselves are part and parcel of transferable skills.

**Table 2.** Lists of transferable skills needed in non-academic sector (DocEnhance deliverable 1.1)

<b>Industrial sector</b> Finland	<b>Technology sector</b> Spain	<b>Non-profit sector</b> Slovakia	<b>Data-driven sectors</b> Norway
<ul style="list-style-type: none"> <li>• Digital skills</li> <li>• Communication &amp; presentation skills</li> <li>• Identification of own skills &amp; communication to different audiences</li> <li>• Problem solving</li> <li>• Management &amp; leadership skills</li> <li>• Contextual flexibility</li> <li>• Creativity</li> <li>• Adaptability, motivation &amp; ethics</li> <li>• Teamwork &amp; networking</li> <li>• Language skills</li> </ul>	<ul style="list-style-type: none"> <li>• Adaptability &amp; flexibility</li> <li>• Collaboration &amp; teamwork</li> <li>• Motivation</li> <li>• Language skills</li> <li>• Presentation skills</li> <li>• Permanent self-learning</li> <li>• Ability to address different audiences</li> <li>• Understanding business culture/ organisational structures</li> <li>• Participation in non-research activities</li> <li>• Time management</li> </ul>	<ul style="list-style-type: none"> <li>• Personal skills &amp; abilities: empathy, motivation, resilience, adaptability, flexibility, ethics, social responsibility</li> <li>• Communication &amp; presentation skills</li> <li>• Organisational &amp; execution skills: project &amp; financial management, creativity</li> <li>• Management &amp; entrepreneurial skills</li> <li>• Leadership, problem-solving, critical thinking</li> <li>• Teamwork</li> <li>• Language skills</li> </ul>	<ul style="list-style-type: none"> <li>• Understanding &amp; analysing different types of data</li> <li>• Running statistics</li> <li>• Handling sensitive data</li> <li>• Metadata management</li> <li>• Text data mining</li> <li>• Visualising &amp; communicating data and statistics</li> </ul>



## 4. INITIAL MODEL FOR DOCTORAL EDUCATION COLLABORATION

The role of doctoral education as the space for knowledge exchange, co-creation, and a tool to enhance European innovation capacity, is widely agreed upon. The collaboration takes different forms, develops doctoral researchers' skills including their innovative thinking and entrepreneurship, and thus contributes to economic growth and jobs both locally and internationally. The DOC-CAREERS II project report (2015) points to the existence of a variety of collaborative models between the universities and its stakeholders. The report successfully summarises the key essential issues in this collaboration. This DocEnhance report further formulates some key questions to be discussed in the beginning stakeholder collaboration. Clarifying joint objectives and practices in stakeholder collaboration from the start secures transparency on the organizational level and supports that it is more routinely and structurally included in the doctoral curriculum.

The following initial model is drafted to support the discussion on shared and stated-out objectives and practices of doctoral education collaboration between universities and the non-academic sector.

**Table 3.** Themes and specified issues to be identified in doctoral educational collaboration

THEMES	DISCUSSION TOPICS	SPECIFIED QUESTIONS
<b>OBJECTIVES OF THE DOCTORAL EDUCATIONAL COLLABORATION</b>	<ul style="list-style-type: none"> <li>shared objectives</li> <li>context-based objectives</li> </ul>	<p>The nature of shared objectives?</p> <ul style="list-style-type: none"> <li>Instrumental: e.g., the development of practice or service provision, innovations (both social and technical) shaping legislation, altering behaviour</li> <li>Conceptual: contributing to the understanding of the phenomenon taking place in the non-academic sector, reframing discussion, and debates</li> <li>Capacity building: technical and personal skill development.</li> </ul> <p>see <a href="https://esrc.ukri.org/research/impact-toolkit/what-is-impact/">https://esrc.ukri.org/research/impact-toolkit/what-is-impact/</a></p>
<b>ACTORS AND MAIN ACTIVITIES IN THE COLLABORATION</b>	<ul style="list-style-type: none"> <li>key actors and their roles in the collaboration</li> <li>main activities</li> </ul>	<ul style="list-style-type: none"> <li>the main role of the doctoral researcher during the different steps and activities in the collaboration process?</li> <li>the defined milestones to check the achievements in the process?</li> </ul>
<b>DOCTORAL PROGRAMME</b>	<ul style="list-style-type: none"> <li>the requirements of the doctoral programme</li> </ul>	<ul style="list-style-type: none"> <li>discipline-based programme/ multidisciplinary programme?</li> <li>special programme?</li> </ul>

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<b>UNDER DISCUSSION</b>		
<b>CURRICULUM OF DOCTORAL STUDIES AT THE UNIVERSITY</b>	<ul style="list-style-type: none"> <li>the role of working life relevance of the studies in the doctoral study programme</li> </ul>	<ul style="list-style-type: none"> <li>how is the collaboration embedded in the doctoral programme curricula?</li> <li>doctoral researcher's study plan practices</li> </ul>
<b>TRANSFERABLE SKILLS</b>	<ul style="list-style-type: none"> <li>the definitions of transferable skills</li> </ul>	<ul style="list-style-type: none"> <li>what kind of courses and professional development training university has to offer regarding specified transferable skills for doctoral researcher?</li> <li>what are the transferable skills that doctoral researcher can achieve in the collaborative activities with the non-academic sector?</li> <li>any tools to be used as a support in the identification work (e.g., Vitae Research Framework Planner)?</li> </ul>
<b>SUPERVISION ARRANGEMENTS</b>	<ul style="list-style-type: none"> <li>practices in nominating the PhD supervisors and requirements for them</li> </ul>	<ul style="list-style-type: none"> <li>more than one nominated supervisor?</li> <li>responsible supervisor?</li> <li>nominated following advisor/supervision group?</li> <li>how the roles and tasks in supervision are agreed?</li> <li>what are the practices in keeping contact between supervisors at the university and at non-academic sector?</li> <li>the practices in keeping contact with the doctoral researcher?</li> <li>how the supervision activities are planned regarding the form of dissertation, e.g., publication based or monograph?</li> </ul>
<b>AGREEMENTS</b>	<ul style="list-style-type: none"> <li>formal agreements needed in collaboration</li> </ul>	<ul style="list-style-type: none"> <li>what kind of formal agreements need to be done?</li> <li>support services available at the university?</li> </ul>
<b>TEMPORAL AND SPACE ASPECTS</b>	<ul style="list-style-type: none"> <li>temporal and space resources of the collaborators</li> </ul>	<ul style="list-style-type: none"> <li>the collaboration continuing the whole doctoral process? shorter period?</li> <li>time resources available for the collaboration?</li> <li>shared understanding of the needed time resources in collaboration?</li> </ul>



		<ul style="list-style-type: none"> <li>the kind of periods the doctoral researcher is working face-to-face in the non-academic sector?</li> <li>the periods the doctoral researcher is collaborating virtually with the non-academic sector?</li> <li>the time needed in participating in academic conferences, courses and writing?</li> </ul>
<b>FUNDING</b>	<ul style="list-style-type: none"> <li>organizational funding resources</li> <li>external funding resources for the collaboration</li> </ul>	<ul style="list-style-type: none"> <li>what does the funding cover?             <ul style="list-style-type: none"> <li>salary for the doctoral researcher?</li> <li>mobility costs?</li> <li>some direct financial resources for the non-academic sector?</li> </ul> </li> </ul>
<b>CULTURAL ENVIRONMENTS</b>	<ul style="list-style-type: none"> <li>the main features of the environments in terms of learning and research environment</li> </ul>	<ul style="list-style-type: none"> <li>the doctoral researcher's possibilities to have impact on the process?</li> <li>milestones defined for checking?</li> <li>the goal to have dialogical relationships?</li> <li>commitment level of the actors in the collaboration?</li> </ul>
<b>CONTINUITY AFTER GRADUATION</b>	<ul style="list-style-type: none"> <li>the interests and possibilities to continue the collaboration after the graduation</li> </ul>	<ul style="list-style-type: none"> <li>any special funding programmes that enable continuity?</li> <li>alumni activities with the university?</li> </ul>



## 5. CONCLUDING REMARKS

*Research undertaken **with** rather than **on** people in a collaborative, iterative process of shared learning.*

(<https://esrc.ukri.org/research/impact-toolkit/what-is-impact/>)

This DocEnhance report builds on and further develops existing and widening discussions on stakeholder and intersectional collaboration in European doctoral education. The initial model provided center stages clear target setting, jointly agreed-on rules, practices, and clearly stated out mapping of the doctoral process and competences as the foundation of any such collaboration. Any single model never solved the challenges of organisational collaboration in doctoral education; this needs to be a negotiated process. Thus, our concluding remarks point to the continuous dialogue between the academic and non-academic sector in doctoral education development efforts.

- It **takes time** to build understanding on the **shared goals** of the collaboration in the context of **doctoral education** and to **identify both individual and the organisational interests and objectives**.
- **Formal agreements and arrangements** need to be available from the beginning of the process.
- **The diversity of possible actors** requires space for flexibility in collaboration and rechecking the goals throughout the process.
- **Transparent collaboration practices** and **supervision agreements** (roles, division of labour, practices) secure the quality of collaboration for both sectors.
- **Pedagogical practices grounded in two contexts ideally engage the doctoral researcher** to be active in the process.
- **Continuity in collaboration requires and is based on trust between parties**.
- **Knowledge-exchange** is very much about **mindset, personal qualities, and researcher mission** in collaboration.
- The **structural and cultural obstacles in the process** cannot be solely overcome by economic solutions.
- **Organisational collaboration between the university and non-academic sector** is one key means to **develop core regional ecosystems with global impact**.



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